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Towards a taxonomy of projective content

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Abstract

Projective contents, which include presuppositional inferences and Potts' (2005) conventional implicatures, are meanings which are projected when a construction is embedded, as standardly identified by the "Family of Sentences" diagnostic (e.g. Chierchia and McConnell-Ginet 1990). This paper establishes distinctions among projective contents on the basis of a series of diagnostics (including a variant of the Family of Sentences diagnostic) that can be used with linguistically untrained consultants. This methodological advance allows validity of generalizations to be examined cross-linguistically. We apply the diagnostics in two languages, focussing on Paraguayan Guaraní (Tupí-Guaraní), and comparing the results to those for English. Our study of Paraguayan Guaraní is the first systematic exploration of projective content in a language other than English. Based on the application of our diagnostics to a wide range of constructions, three meaningful subclasses of projective contents emerge. The resulting taxonomy of projective content has strong implications for contemporary theories of projection (e.g. Karttunen 1974; Heim 1983; van der Sandt 1992; Potts 2005; Schlenker 2009), which were developed for the projective properties of subclasses and fail to generalize to the full set of projective contents.

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1 Introduction: Projective contents as a domain for cross-linguistic study

The goal of this paper is to establish distinctions among a range of inferential phenomena which have in common the property of "projection", the term being due to Langendoen and Savin (1971). Projection concerns implications associated with particular constructions, so-called "triggers". What is notable about these implications is that they tend to survive – that is, they tend to be understood as commitments of the speaker – even when the trigger is deeply embedded under other operators.[1] Projection is typically diagnosed using the "Family of Sentences" diagnostic (Chierchia and McConnell-Ginet 1990:29f.), illustrated with the examples in (1).

(1) Chierchia and McConnell-Ginet (1990:28)

a. The present queen of France lives in Ithaca.

b. It is not the case that the present queen of France lives in Ithaca.

c. Does the present queen of France live in Ithaca?

d. If the present queen of France lives in Ithaca, she has probably met Nelly.

In this illustration, we observe the behavior of the implication that there is a unique queen of France, which is triggered by the use of the definite *the present queen of France*. An utterance of sentence (1a) entails both that there is a unique queen of France and that she lives in Ithaca. Utterances of the sentences (1b–d) do not imply that anyone lives in Ithaca, but do still, under normal circumstances, commit the speaker to the claim that France has a unique queen. We call this behavior of the existence implication *projection* and call this implication a *projective content*: an element of content which has the potential to project.

The range of constructions associated with inferences that exhibit projective behavior is huge. It includes all inferences standardly analyzed as presuppositions or as conventional implicatures (and this whether the term is used in the sense of Grice 1975 or that of Potts 2005). We argue in this paper that projective content should be divided into three subclasses, which echo some commonly made distinctions, and yet subtly cross-cut them. These subclasses, summarized in Table 1, are distinguished by two properties that a projective

[1] Projective contents are understood as commitments of the speaker only if they project *globally*. For simplicity, we set aside cases of intermediate projection, not relevant to our purposes here.

	Properties of contents		
Classes	Projection	Contextual Felicity	Local Effect
A.	yes	yes	yes
B.	yes	no	no
C.	yes	no	yes

Table 1: Three classes of projective content in English and Paraguayan Guaraní

implication may have: (i) being subject to a "Contextual Felicity" constraint, and (ii) giving rise to a "Local Effect". The term "Contextual Felicity" constraint refers to a particular condition on the felicitous use of a trigger, namely, that it can be used felicitously only if some implication associated with the trigger is established in the context of use. This property is discussed in detail in section 3. "Local Effect" refers to the way in which a triggered implication interacts with operators: Some part of the content of a clause embedded under an operator is said to have a Local Effect just in case it contributes to the content over which the operator is understood to take scope. For detailed discussion of this property, see section 5.

As seen in Table 1, projective contents in class A are associated with a Contextual Felicity constraint and have a Local Effect, class B projective contents are not associated with a Contextual Felicity constraint and do not have a Local Effect, and class C projective contents are not associated with a Contextual Felicity constraint but have a Local Effect. Broadly speaking, class A involves cases of anaphoric and indexical triggers, class B involves many cases Potts (2005) termed conventional implicatures, but also some contents associated with indexical and anaphoric expressions, and class C includes a mixture of cases standardly described as presuppositions along with inferences whose analysis is more controversial, such as those associated with approximatives (e.g. *almost*) and exclusives (e.g. *only*). Strikingly, our survey of over twenty inference types associated with expressions in two languages did not reveal any inferences that have a Contextual Felicity constraint but do not have a Local Effect.

Early observations about projection identified it as a property of presuppositional content, and projection has subsequently been studied entirely from this perspective. In more recent work, however, the close identification of presupposition with projection has been undermined. Chierchia and McConnell-Ginet (1990:351) observe that the content of English non-restrictive relative clauses projects, but hesitate to call this content presuppositional because it does not seem to be subject to any requirement to be "background" for the addressee. Beaver (2001) comes to similar conclusions regarding English parentheticals. And Potts (2005) takes robust projection behavior to be a core property of the components of meaning he classes as conventional implicatures (including inferences triggered by parentheticals, expressives, and honorifics), while at the same time arguing that conventional implicatures are not presuppositions. These observations constitute a serious challenge to most existing accounts of projection such as Heim (1983), van der Sandt (1992), Schlenker (2007), as these are all predicated on the assumption that projection is a consequence of the presuppositional status of the relevant implication. (See Simons et al. 2010 for further discussion.)

The fact that all the inference types discussed in detail in this paper share the property of projectivity provides a rather obvious motivation for studying them together. But projectivity is almost certainly not the only property that these inferences share. Based on work in English (The Authors 2010), we have found what we take to be compelling evidence of a relationship between projection and "at-issueness", with Jayez (2009) providing cross-linguistic support from French.

A proposition is defined to be at-issue if it is the part of an utterance's content which is used by the speaker to address a question that is (implicitly or explicitly) under discussion (Roberts 1996). What we have found is that when embedded content projects, it is almost invariably not at-issue, and *vice versa*. Thus, for example, the existence of a French queen would be expected to be not at-issue for an utterance of

(1d), because we do not naturally take (1d) to be a response to a question about whether there is a French queen: it is in that sense that the existence of a French queen is not at-issue. Furthermore, while there are exceptions to the strong generalization that embedded content projects if and only if it is not at-issue (see e.g. Jayez 2009; Simons et al. 2010; Potts to appear), all these exceptions are at the level of tokens rather than types. That is to say, while we are aware of individual examples for which either not at-issue content projects, or at-issue content fails to project, we are not aware of any construction types for which it is generally the case that either of these hold. At the very least we can confidently state that for English, and for every construction type associated with projective content, that content tends to project when it is not at-issue. Thus while we will not study at-issueness in this paper, and must refer the reader to The Authors (2010) for discussion of both the empirical basis of the link with at-issueness and for discussion of why this is a theoretically important, we do think that the generality of the link with (non-)at-issueness underlines the commonality between different types of projective content, and provides an important additional motivation for studying the class of projective contents as a whole.

The strategy that we have chosen for the study of this class of meanings – a strategy whose utility is demonstrated by the results reported in this paper – involves careful investigation of the linguistic behavior of a wide range of triggers of projective meaning. A theoretical account is, after all, unlikely to be successful unless it is founded on a robust grasp of the phenomenon to be explained. We suggest that in order to achieve an adequately robust understanding, we need to examine projection not only in English (as has typically been the case),[2] but in other languages too. And we need reliable data based not only on the judgments of theoreticians, but also on the linguistic judgments of theoretically untrained native speaker consultants.

These desiderata raise some interesting challenges at the interface of theory and methodology. Theoreticians tend to take a "we know it when we see it" approach to projection. But if projection is to be diagnosed by judgments rendered by consultants in the field or by subjects in the lab, we need to determine exactly which judgments are relevant, and we need a strategy to elicit these judgments reliably. Similar issues arise for the identification of the Contextual Felicity constraint and Local Effect, which distinguish among sub-classes of projective contents.

One goal of this paper, therefore, is to put the study of projection on a sounder empirical footing. We propose here an extension of the standard empirical paradigm of constructed examples which is appropriate for cross-linguistic work with consultants who have no specific training in linguistics. To be clear, we do not wish to make any deep philosophical point about what constitutes sound methodology. Or perhaps it would be more apropos to say that to the extent that we will make a methodological point, we will make it primarily by doing rather than saying. Thus the bulk of this paper will be taken up not with meta-discussion about the nature of data collection, but with description and explanation of the development and application of specific diagnostic methods that we have applied in two typologically unrelated languages, English and Paraguayan Guaraní (Tupí-Guaraní).

The significance of providing a cross-linguistic foundation for empirical work on presupposition, and projective contents more generally, is highlighted by recent work of Matthewson (2006). On the basis of detailed fieldwork on St'át'imcets, she draws the striking conclusion that St'át'imcets presuppositions do not impose a constraint on the common ground, and are informative. She makes the assumption that presuppositions in English involve common ground constraints (Stalnaker 1973, 1974), and hence concludes that there is a significant difference between presuppositionality in English and in St'át'imcets.[3] She arrives at

[2]Some research has been carried out on the related topic of presupposition in languages other than English, for example, Levinson and Annamalai (1992) on Tamil, Potts and Kawahara (2004) on Japanese, Matthewson (2006) on St'át'imcets (Salish), Amaral (2007) on European Portuguese and Jayez (2009) on French.

[3]As noted, our own findings concerning English and Paraguayan Guaraní are that many of the standard presupposition triggers do not impose a Contextual Felicity constraint. The correct conclusion to draw from Matthewson's data may thus be that St'át'imcets is just like English, that is, that the relevant presupposition triggers do not impose common ground constraints in either language.

this result by applying the "Hey, wait a minute!" (HWAM) test, which assumes that consultants will respond with utterances like "Hey, wait a minute!" to utterances containing presupposition triggers in contexts where the presupposition is not entailed by the common ground. The assumption is that if consultants respond with e.g. "Hey, wait a minute!", the utterance so responded to has a presupposition failure and, hence, contains a presupposition trigger.

While it would be worthwhile to build directly on Matthewson's work, the HWAM test is not one of the diagnostics that we have yet been able to confidently apply in our own fieldwork, and HWAM will thus not be utilized in this paper.[4] Nonetheless, we think it important to point out that the results we will report on, while revealing subtle differences between English and Paraguayan Guaraní (henceforth Guaraní), go broadly in the opposite direction from Matthewson's. In terms of the metrics we use, the two languages we studied are broadly similar, thus suggesting that the properties we study may reflect quite general cross-linguistic principles. So, broadly speaking, while Matthewson argued against strong presuppositional universals, the data we present suggests that there may be quite strong universals operating not only among standard presuppositions, but beyond.

The paper proceeds as follows. Section 2 provides some background on the development of the diagnostics used in this paper and introduces the triggers of projective content of Guaraní explored in this paper. Sections 3 to 5 illustrate diagnostics for exploring Contextual Felicity, Projection and Local Effect in the field, respectively; we motivate in section 4 why diagnosing Contextual Felicity prior to Projection is necessary. In section 6, we present a summary of the empirical findings in an expanded version of Table 1 and characterize the three subclasses of projective content and their relationship to previously characterized meaning types, such as classical presuppositions and Potts' conventional implicatures. This section also points out similarities and differences between projective contents in English and Guaraní. As discussed in section 7, the taxonomy of projective content that empirically emerges in the two languages has strong implications for contemporary theories of projection (e.g. Karttunen 1974; Heim 1983; van der Sandt 1992; Potts 2005; Schlenker 2009), which were developed for the projective properties of subclasses and fail to generalize to the full set of projective contents. This section also briefly discusses implications of this taxonomy of projective content for the general taxonomy of meaning. Section 8 concludes the paper.

In this paper, we thus hope to make contributions on several fronts. First, the work is relevant to researchers in formal semantics and pragmatics for its arguments that projective content is heterogeneous in ways not currently appreciated, ways which have important consequences for theories of projection. Second, the diagnostics, and the methodology which underlies them, may be of interest to fieldworkers and to anyone interested in collection of data from non-linguist language consultants, in the field or in the lab. Finally, the paper makes a modest contribution to semantic typology, containing the first analysis of a wide range of projective contents in a non-European language.

2 Paraguayan Guaraní triggers and criteria for diagnostics

The choice of English and of Guaraní for the detailed study of projection is not motivated by any special properties of the languages. English is the native language of three of the four authors and has been the focus of the vast majority of work to date on presupposition and projection. The first author of the paper has extensive knowledge of Guaraní and a great deal of experience conducting fieldwork in this language. In general, exploring meaning in collaboration with linguistically untrained native speaker consultants requires that the fieldworker have knowledge of a wide range of grammatical structures of the language, including phonological, morphological, syntactic and pragmatic factors that affect whether an expression is grammatical and felicitous in a particular context (see also Matthewson 2004:370). The utterances to be judged must

[4] We note that consultants could respond with "Hey, wait a minute!" to an utterance for a number of reasons, e.g. to challenge an implicature of the utterance or to indicate some other pragmatic oddity of the utterance besides presupposition failure.

be grammatical since otherwise a consultant might reject the utterance in a context not because it is false or infelicitous but simply because it is ungrammatical (Matthewson 2004:386,401). And to be judged true or felicitous, utterances must be presented in discourse contexts that appropriately control for the relevant contextual factors.

Guaraní is unusual among South American indigenous languages, not just because it is widely spoken (by about four million people in Paraguay and surrounding countries), but also because it is fairly well-documented. In addition to reference works (Gregores and Suárez 1967; Velázquez-Castillo 2004a), there are papers and books on the phonetics and phonology of the language (e.g. Lunt 1973; Rivas 1974; Adelaar 1994; Walker 1999), its morpho-syntax (e.g. Velázquez-Castillo 1996, 1999, 2002a,b, 2004b; Nordhoff 2004), word order and object marking (e.g. Velázquez-Castillo 1995; Tonhauser and Colijn 2010; Shain and Tonhauser 2010), its prosody (Clopper and Tonhauser 2011, ms), as well as its temporal, aspectual and modal system (e.g. Dessaint 1996; Liuzzi 1987; Liuzzi and Kirtchuk 1989; Tonhauser 2006, 2007, 2009, 2010, to appear, Tonhauser ms.). Exploring projective contents in Guaraní in collaboration with native speaker consultants is greatly facilitated by this wealth of information already available on the language.

However, our goal in developing the diagnostics used here was not to devise methods specifically for the study of Guaraní, or of English, but to develop a "toolkit" that can be adapted for use with different languages and also in different settings (e.g. in fieldwork with individual consultants and also in more conventional experimental settings). This required the diagnostics to be formulated as independently as possible from any language-particular lexical inventory or (morpho-)syntactic constructions, so as to be applicable in a typologically diverse range of languages and to thus facilitate cross-linguistic comparison of projective contents. A diagnostic that would fail in this respect is one that, for example, requires forming sentences with negated auxiliary verbs: since many languages, including Guaraní, don't have such verbs, such a diagnostic would not be cross-linguistically applicable. In combination with this flexibility, however, we have attempted to present the diagnostics in adequate detail so as to make it possible to derive comparable cross-linguistic results.

A second critical desideratum for the diagnostics was that they should rely only on judgments by (linguistically untrained) native speaker consultants that can be reliably obtained, i.e. consultants should understand the task the diagnostic asks them to perform and the task should be natural.

Third, in keeping with standard practice in experimental design, the diagnostics should be formulated such that they do not bias consultants towards a particular answer. The types of judgments mainly used in eliciting the data presented in this paper are briefly discussed in the following.[5]

The diagnostic for Contextual Felicity developed in section 3 relies on judgments of felicity. Such judgments, like judgments of truth, can only be made for utterances presented in a context.[6] To identify the constraints an expression may place on context, an utterance containing the relevant expression is presented to consultants in contexts in which the utterance is expected to be acceptable and in contexts in which it is not expected to be acceptable. Systematically varying a context provides evidence for the kinds of contextual felicity constraints the expression is associated with: "...the very fact that a particular sentence can or

[5]The majority of the data presented in this paper were collected by the first author during fieldwork trips to Paraguay in 2008, 2009 and 2010. Apart from research on the constructions used in the diagnostics and basic meaning properties of most of the Guaraní triggers considered here, the diagnostics have so far been applied only with one Guaraní consultant — a situation not ideal but also not untypical for fieldwork-based research. Since this consultant has been the first author's main consultant since 2004 and is therefore very familiar with the highly collaborative process of fieldwork on their native language, developing the diagnostics with this consultant went hand-in-hand with applying them to the full range of triggers. Application of these diagnostics with additional consultants is planned for August 2011.

[6]The context is taken here to be a body of information held in common by the interlocutors in the discourse, including information from the utterance situation, the linguistic context in which the utterance was made, as well as the information structure of the discourse that includes the utterance (e.g. Roberts 2004:197f.). In the first author's fieldwork on Guaraní, contexts are presented verbally either in Guaraní or in Spanish (see Matthewson 2004 for the appropriateness of using a meta-language to present contexts, but cf. Tonhauser ms.).

cannot be used in an out-of-the-blue context (and therefore does not or does have certain felicity conditions) is itself data" (Matthewson 2004:390f).

The diagnostic for Projection developed in section 4 relies on felicity judgments and also on what we call "implication judgments". That is, the diagnostic involves asking a consultant whether a given utterance in a particular context gives rise to a target implication. Note that the term "implication" is neutral between assertion, entailment, conversational implicature, and so on. It is clearly the job of the theorist to determine the proper analysis of a given implication. However, we take it that the identification of the presence of an implication is a basic data point with respect to which speakers can be expected to have judgments. Indeed, such judgments have already been successfully used in experimental research on scalar implicatures (e.g. Geurts et al. 2010) and presuppositions (e.g. Schwarz 2007; Beaver and Clark 2008; Chemla 2009), where a common paradigm is to ask (linguistically untrained) participants to assess whether an utterance has a particular implication or which of a given set of implications an utterance has. In contrast, Matthewson (2004) argues that semantic/pragmatic fieldwork should be limited to consultants' judgments of grammaticality, truth and felicity. We suggest that the diagnostics developed below offer a reliable strategy for eliciting information about implications drawn by interpreters.

In addition to direct elicitation of implication judgments, the diagnostics proposed make use of what we call "implicit implication judgments", where consultants are asked to answer a question, the answer to which allows the fieldworker to determine whether the target implication arises from the utterance or not. Particularly useful are contexts where implicit implication judgments are based on the goals or desires of a rational agent. To illustrate, consider the example in (2): the context of this example presents Maria as having a particular goal, namely to interview people who had a near-death experience. Rather than asking a consultant whether (2) means that Raul came close to dying, a consultant is asked whether Maria would interview Raul, given Paula's utterance.[7]

(2) Context: Maria wants to interview people who had a near-death experience. Paula tells her about her neighbor Raul:

Raul **aimete** o-mano.
Raul almost A3-die

'Raul almost died.'

If a consultant affirms that, yes, Maria would want to interview Raul, this can be taken as evidence that (2) conveys that Raul came close to dying and thus as (indirect) evidence for the hypothesis that the adverb *aimete* 'almost' contributes an proximal implication in this particular utterance.

In the diagnostic for Local Effect in section 5, we make use of judgments of truth, where consultants are asked to judge whether a particular utterance is true in a particular context. The diagnostic for Local Effect developed in that section asks consultants to judge the acceptability of complex utterances such as (3), e.g. whether it is possible for the second conjunct to be true in the context of the first. ((3) is typically judged to be unacceptable.)

[7]The Guaraní examples in this paper are given in the standardized orthography of the language used in Paraguay (Ministerio de Educación y Cultura 2004, Velázquez-Castillo 2004a:1421f.), except that all postpositions are attached to their host. Following this orthography, accents are not written for normally accented words (stress on the final syllable); stressed nasal syllables are marked with a tilde. The set A cross-reference prefixes (which mark transitive subjects and some intransitive subjects) are *a(i)*– 'A1sg', *ja(i)*– 'A1pl.incl', *ro(i)*– 'A1pl.excl', *re(i)*– 'A2sg', *pe(i)*– 'A2pl', and *o(i)*– 'A3'; the set B prefixes (which mark some intransitive subjects and possessors) are *che(r)*– 'B1sg', *ñande(r)*– 'B1pl.incl', *ore(r)*– 'B1pl.excl', *nde(r)*– 'B2sg', *pende(r)*– 'B2pl', and *i(ñ)–/h*– 'B3'. The two portmanteaux prefixes *ro(i)*– '12sg' and *po(i)*– '12pl' refer to a first person subject and a second person (singular/plural) object. The following glosses are used: ABL = ablative, CAUS = causative, COMPLETE = completive aspect, CONTRAST = contrastive topic, DIM = diminuitive, excl = exclusive, incl = inclusive, JE = middle/passive, MIGHT = possibility modal, MUST = necessity modal, NEG = negation, NOM = nominalization, PERFECT = perfect aspect, PURP = purpose, TERM = terminative aspect, pron.O/S = object/subject pronoun, PROSP = prospective aspect/modal, QU = question, RC = relative clause.

(3) #Andres o-mano kuehe ha Andres o-sená-ta ché-ndive ko pyharé-pe.
Andres A3-die yesterday and Andres A3-have.dinner-PROSP pron.S.1sg-with this night-at
'Andres died yesterday and Andres is going to have dinner with me tonight.'

Having laid out the basics of our methodology, we turn now to an overview of the Guaraní expressions which are investigated in this paper. These are primarily translations of expressions in English which trigger projective contents.[8] Possible translations were straightforwardly identified by elicitation and using dictionaries, except in the case of the change of state verb *stop*: translations of English utterances like *Juan stopped smoking* first resulted in Guaraní translations with the verb *(o)heja* 'leave' and the nominalized argument *la jepita* 'the smoke', as in (4a). While this construction triggers projective content, it did not turn out to be productive, as it was not used to express changes of state with other predicates. It was thus replaced in subsequent fieldwork with the construction *nd(a)–...–vé-i-ma* (NEG-...-more-NEG-PERFECT) 'not anymore': like its English translation, the utterance in (4b) implies that Juan used to smoke in the past but has ceased smoking (as shown in sections 3 and 4).

(4) a. Juan o-heja la jepita.
Juan A3-leave the smoke
'Juan stopped smoking.' (Lit.: John left the smoke.)

b. Juan **nd**-o-pita-**vé-i-ma**.
Juan NEG-A3-smoke-more-NEG-PERFECT
'Juan does not smoke anymore.'

In addition to the projective content of the change of state expression *nd(a)–...–vé-i-ma* 'not anymore' introduced in (4b), sections 3 to 5 explore properties of the projective contents of the Guaraní expressions illustrated in the examples in (5) to (9) below. We focus here on presenting the relevant expressions and their implications, and the discussions in the next sections support the claim that the Guaraní expressions have implications comparable to their English translations. In line with the empirical, theory-neutral approach taken in this paper, all implications of the relevant Guaraní expressions are characterized as propositions (as opposed to characterizing some implications as constraints).

The naturally occurring examples in (5) feature the adverb *avei* 'too', the adverb *aimete* 'almost' and the suffix *–nte* 'only', respectively. The adverb *avei* 'too' in (5a), which occurs after the noun phrase *vúrro tuja havẽ* 'very old donkey', is felicitous here since there is another contextually salient entity that has the property ascribed to the donkey, i.e. that runs down the path. The adverb *aimete* 'almost' in (5b) conveys that the brother came close to falling onto the spines of the coconut plant (the 'proximal' implication), but ultimately didn't (the 'polar' implication, which we take to be projective, but see e.g. Horn 2002). And the suffix *–nte* 'only' in (5c) conveys that the head of the monkey stuck out the hole in the tree (the 'prejacent' implication) and that it was the only body part that stuck out (the 'exclusive' implication — see also Horn 1996; Roberts 2006; Beaver and Clark 2008 on English *only*).

(5) a. Context: A jaguar and a donkey got into a fight. The donkey hit the tiger and then:
Jaguarete o-ñani tapé-re ha vúrro tuja havẽ **avei** upe tapé-re.
jaguar A3-run path-on and donkey old moldy too that path-on
'The jaguar ran down a path and the very old donkey, too, ran down that path.' (Krivoshein de Canese et al. 2005:73)

[8] Other triggers, such as the contrastive topic clitic *=katu* (First.Author ms a) and the reportative evidential clitic *=ndaje* (First.Author ms b) , were identified by conducting detailed fieldwork on the meaning of these expressions. They are not discussed in this paper.

b. Context: As children, Maria and her brother once had to cross a field with two bulls on it.

Ha kyhyje-pó-pe ro-hasa ha che-kyvy **aimete** ho'a mbokaja ratĩ-'ári.
and scared-hand-in A1pl.excl-pass and B1sg-brother almost A3.fall coco thorn-on

'And we passed fearfully and my brother almost fell into the spines of a coconut plant.'

c. Context: A monkey looked for a place to stay dry in the rain.

O-ho oi-ko ha'e yvyra kuá-pe, iñ-akã-ngue-mí-**nte** o-nohẽ o-kẽ-me.
A3-go A3-enter pron.S.3 tree hole-in B3-head-NOM.TERM-DIM-only A3-come.out door-in

'He entered into the hole of a tree, only his little head stuck out.' (Acosta Alcaraz and Zarratea 2003:23)

The projective content of possessive and demonstrative noun phrases is also explored in this paper.[9] The example in (6a), repeated from (5b), features the possessive noun phrase *che-kyvy* (B1sg-brother) 'my brother', which implies that the speaker has a brother (the 'possession' attribution; a potential uniqueness implication is not explored here). Demonstrative noun phrases are formed with the demonstrative determiners *ko* 'near the speaker', *pe* 'near the addressee' or *upé/amõ* 'away from both the speaker and addressee' (Gregores and Suárez 1967:141); only the former two, illustrated in (6b) and (6c), respectively, are explored in this paper. The two relevant implications of demonstrative noun phrases are that the demonstratum can be identified (e.g. that the reader of (6c) can identify the entity referred to with *pe jagua* 'that dog')[10] and the implication that the demonstratum has the property denoted by the noun (e.g. that the demonstratum of the demonstrative noun phrase in (6c) is a dog). Both of these implications relate to implications of definite descriptions according to Heim (1982): the first corresponds to her familiarity implication (a presupposition for her), the second to her descriptive content implication.

(6) a. Context: As children, Maria and her brother once had to cross a field with two bulls on it.

Ha kyhyje-pó-pe ro-hasa ha che-kyvy **aimete** ho'a mbokaja ratĩ-'ári.
and scared-hand-in A1pl.excl-pass and B1sg-brother almost A3.fall coco thorn-on

'And we passed fearfully and my brother almost fell into the spines of a coconut plant.'

b. Context: A young girl was transformed into a bird.

Upe pyhare-guive o-je-hecha **ko guyra pyahu** o-mimbi-pá-va jeguá-gui.
that night-since A3-JE-see this bird new A3-shine-COMPLETE-RC jewelry-ABL

'Since that night, one has seen this new bird that shines with beauty.' (Acosta and de Canese 2003:94)

c. Context: A cricket is interrupting a man's picnic.

O-henói hymba jagua peteĩ-me ha **pe jagua** o-ñepyrũ tuicha o-ñaro.
A3-call B3.domesticated.animal dog one-at and that dog A3-begin big A3-bark

'He called one of his dogs and that dog began barking loudly.'

The Guaraní subject pronoun *ha'e* refers to third person animate entities: in (7), for example, it refers to the grandmother. The two relevant implications of *ha'e* are that there is a contextually salient referent (the existence implication) and that the referent is animate (the animacy implication).

[9]Guaraní does not have a definite determiner; determinerless noun phrases like *jagua* 'dog' can receive definite and indefinite interpretations (Tonhauser and Colijn 2010). Not all occurrences of the (borrowed) Spanish determiner *la* convey definiteness.

[10]The relevant notion of identification can only be made precise given a theory of context and discourse referents; we make do here with this informal characterization.

(7) Context: A consultant tells that, as a child, she lived with her grandmother.

Ha'e o-pu'ã voi-éterei o-ñami-ha-guã i-vaka.
pron.S.3 A3-get.up early-very A3-milk-NOM-PURP B3-cow

'She had to get up very early to milk her cow.'

While the above expressions frequently occur in the corpora available to the first author and in her fieldwork notes, expressives, appositives and non-restrictive relative clauses did not, but were easily obtained in elicitation sessions. The two expressives explored in this paper are given in (8): since both convey a very negative attitude of the speaker towards the referent of the noun phrase in which they occur, both *mbóre* and *añа memby* (lit. devil child) are translated here with the English expressive *bastard* (Potts 2005). The appositive in (9a) conveys that Maria is one of the speaker's friends and the non-restrictive relative clause in (9b), which is marked with the relative clause marker *-va'e* on the verb, that Maria was born in Germany.

(8) Context: Sabina runs into the house, breathlessly, and says:

a. Pe Márko **mbóre** o-monda che-kabayu!
that Marko bastard A3-steal B1sg-horse
'That bastard Marko stole my horse!'

b. María o-menda pe **añа memby** Ríchard-re!
Maria A3-marry that devil child Richard-at
'Maria married that bastard Richard!'

(9) a. María, **che-angiru peteĩ**, o-vá-ta Paraguaý-pe.
Maria B1sg-friend one A3-move-PROSP Asunción-to
'Maria, one of my friends, is going to move to Asunción.'

b. María, **o-nasẽ-va'e-kue** **Alemánia-pe**, oi-ko Brasíl-pe.
Maria A3-born-RC-NOM.TERM Germany-in A3-live Brasil-in
'Maria, who was born in Germany, lives in Brasil.'

All the expressions just discussed were tested for their behavior with respect to the Contextual Felicity constraint, Projection and Local Effect. The relevant diagnostics and the results of their application are discussed in turn in the following three sections.

3 Contextual felicity

As noted in the introduction, presuppositions are thought of as the paradigm case of projective contents; and presupposition triggers are standardly thought to impose constraints on the conversational context in which they are used. Specifically, it is standardly claimed that utterance of a sentence with presupposition *p* is felicitous only if *p* is entailed by the context. However, when we explore the full range of projective contents, it becomes clear that many triggers of projective contents are not straightforwardly subject to this constraint, including many which are standardly analyzed as presupposition triggers. Our first diagnostic provides a method for diagnosing the presence of this constraint, which we call the Contextual Felicity constraint.

We begin with a definition of the property under investigation. Since a particular trigger may contribute more than one (projective) content, but not all such contents need be associated with a Contextual Felicity

constraint, the property is formulated as a property of a trigger with respect to a particular implication. The definition in (11) makes reference to *m*-neutral contexts, defined in (10).[11]

(10) ***m*-positive and *m*-neutral contexts**
An *m*-positive context is a context which entails *m*. An *m*-neutral context is a context that entails neither *m* nor ¬*m*.

(11) **Contextual Felicity Constraint**
If utterance of trigger *t* of (projective) content *m* is felicitous only in an *m*-positive context, then *t* imposes a Contextual Felicity constraint with respect to *m*.

If a particular trigger of (projective) content *m* is acceptable in an *m*-neutral context, this shows that the trigger is not subject to a Contextual Felicity constraint with respect to *m*. This is captured by the subdiagnostic I. for Contextual Felicity in (12a). A judgment of unacceptability in such a context, however, is not sufficient to diagnose the presence of a Contextual Felicity constraint with respect to *m*. To diagnose this, the same utterance should also be tested in a minimally different *m*-positive context, as per subdiagnostic II. in (12b).

(12) **Diagnostic for Contextual Felicity**
Let *S* be an atomic sentence that contains trigger *t* of (projective) content *m*.

I. If uttering *S* is acceptable in an *m*-neutral context, trigger *t* does not impose a Contextual Felicity constraint with respect to *m*.

II. If uttering *S* is unacceptable in an *m*-neutral context and acceptable in a minimally different *m*-positive context, trigger *t* imposes a Contextual Felicity constraint with respect to *m*.

In the remainder of this section, the application of this diagnostic is illustrated with Guaraní data. These applications demonstrate another, perhaps obvious, methodological issue: in eliciting judgments of felicity of an utterance in a context, the contexts should be plausible and natural-seeming given the experience of the consultant or experimental subject. The scenarios used in the applications below were invented by the first author to suit the particular fieldwork situation. However, these provide an illustration of the various ways in which the relevant kinds of contexts can be established.

The first set of data we discuss in (13) to (16) involves pairs of triggers that are not associated with a Contextual Felicity constraint with respect to the target implication *m*. As per the diagnostic in (12a), we come to this conclusion since the triggers of these contents *m* are acceptable in *m*-neutral contexts. The example in (13) features the expressive *aña memby* (devil child) 'bastard'. Like English *bastard*, using the Guaraní expressive is acceptable in a context where the addressee does not have a low opinion of the referent and did not know prior to the speaker's utterance that the speaker had a low opinion of the referent, as illustrated by (13). The expressive is thus not associated with a Contextual Felicity constraint with respect to the (in this case) negative evaluation.

(13) Context: Julia and Maria work in a bakery and really like their boss Marko because he pays them well. One day, he calls Julia into his office; when she emerges, she says to Maria:

Pe **aña memby** Márko ko'ãga oi-pota a-mba'apo iñ-hermáno karnisería-pe.
that devil child Marko now A3-want A1sg-work B3-brother butcher.shop-in

'That bastard Marko now wants me to work in his brother's butcher shop.'

[11] As noted in section 2, we characterize projective contents as propositions rather than contextual constraints, and the characterization of *m*-positive and *m*-neutral contexts in (10) is congruent with this view (e.g. Stalnaker 1973, 1974; Karttunen 1974; Lewis 1979; Heim 1983). If projective contents associated with a Contextual Felicity constraint were instead characterized as contextual constraints, (10) would define an *m*-positive context as one in which the content *m* is satisfied (see e.g. van der Sandt 1992; Geurts 1999). While we use the previous formulation, our findings could be formulated under either characterization.

The next pair of examples shows that appositives and non-restrictive relative clauses in Guaraní, like their English counterparts, are not associated with a Contextual Felicity constraint: in the examples in (14), these two types of expressions are used in *m*-neutral contexts, e.g. Raul does not need to already know that Simon is Maria's ex-boyfriend in order for (14a) to be acceptable.[12]

(14) a. Context: Raul is new in town. His neighbor Simon invites him to his house for a party and introduces him to Maria. She tells him:

Simon, **che-kichiha-kue**, o-ñe'ẽ Aleman.
Simon B1sg-boyfriend-NOM.TERM A3-speak German

'Simon, my ex-boyfriend, speaks German.'

b. Context: The children in a history class have to give presentations about famous people. Malena has to talk about the pope. She starts with:

Papa Benedícto 16, **o-nasẽ-va'e-kue** **Alemánia-pe**, oi-ko Róma-pe.
Pope Benedict 16 A3-born-RC-NOM.TERM Germany-in A3-live Rome-in

'Pope Benedict the 16th, who was born in Germany, lives in Rome.'

We now turn to examples involving *aimete* 'almost' and *–nte* 'only'. The example in (15a) shows that the adverb *aimete* 'almost' is not associated with a Contextual Felicity constraint with respect to the polar implication (here, that Malena didn't throw up) or the proximal implication (here, that Malena came close to throwing up): the context of this example makes clear that the mother and father have no knowledge of what was going on with their daughter upstairs. The suffix *–nte* 'only' in (15b) is likewise felicitously used although the positive implication, that the youngest daughter cleans the house, is not known to the mother (and neither is the exclusive implication, that nobody other than the youngest daughter cleans the house).

(15) a. Context: A mother calls for her daughter to come down for dinner. Her daughter doesn't appear so she goes upstairs to check on her. When she comes back down, she says to her husband:

Maléna hasy ra'e. **Aimete** o-gue'ẽ.
Malena B3.sick it.seems almost A3-vomit

'It seems that Malena is sick. She almost threw up.'

b. Context: Carla, a mother of three teenage daughters, falls on the way to the supermarket and breaks her leg. After being in the hospital for a week, the girls come to visit her. When she asks them how they are doing, her youngest daughter blurts out:

Ché-**nte** a-mo-potĩ ñande-róga!
pron.S.1sg-only A1sg-CAUS-clean B1pl.incl-house

'Only I clean our house!'

The next two examples we discuss here involve triggers associated with a Contextual Felicity constraint with respect to one implication, but not another. The first such trigger we will consider is a demonstrative

[12] It is an open, empirical question whether expressives, appositives and non-restrictive relative clauses in Guaraní have what Potts (2005) calls an antibackgrounding requirement, such that utterances of sentences like (i), where the content of the e.g. appositive is already given in the context, are infelicitous "due to redundancy" (Potts 2005:34).

(i) Simon che-kichiha-kue. Simon, che-kichiha-kue, o-ñe'ẽ Aleman.
Simon B1sg-boyfriend-NOM.TERM Simon B1sg-boyfriend-NOM.TERM A3-speak German
'Simon is my ex-boyfriend. Simon, my ex-boyfriend, speaks German.'

While Guaraní consultants recognize the redundancy, utterances like (i) are not generally considered unacceptable. It is thus an open question whether this recognition of redundancy is sufficient for introducing an antibackgrounding requirement for the Guaraní expressions or whether this is an instance of cross-linguistic semantic/pragmatic variation.

noun phrase. This construction is not associated with a Contextual Felicity constraint with respect to the implication *m* that the demonstratum has the property denoted by the noun, as illustrated in (16a), but is associated with a Contextual Felicity constraint with respect to the implication *n* that the demonstratum can be identified (as will shortly be discussed with reference to (18) below). Likewise, the third person pronoun *ha'e* in (16b) is not associated with a Contextual Felicity constraint with respect to the implication *m* that the referent is animate, but with respect to the implication *n* that the referent is contextually salient (and this, in turn, will be justified in the discussion of (19), below). To diagnose the relevant implications *m*, the context of the examples in (16) is *n*-positive with respect to the implications *n* that there is a salient referent (for *ha'e*) and that the demonstratum can be identified (for the demonstrative noun phrase).

(16) Context: Maria and Sabina are walking across a meadow. They can see something ahead lying in the grass but can't figure out whether it's a rock, a piece of wood, an animal or a person. Maria has much better vision than Sabina and, as they approach, Maria says:

a. **Pe kuimba'e** o-ke.
that man A3-sleep
'That man is sleeping.'

b. **Ha'e** peteĩ kuimba'e.
pron.S.3 one man
'He's a man.'

Since the context of (16) is neutral with respect to the implications *m* that the referent of *ha'e* is animate and the demonstratum of *pe kuimba'e* 'that man' is a man, these examples provide evidence that these expressions are not associated with a Contextual Felicity constraint with respect to these implications.

The third set of examples in (17) to (19) illustrate the application of the diagnostic for a Contextual Felicity constraint in (12) with Guaraní triggers that are associated with a Contextual Felicity constraint. As mentioned in section 2, we entertain the hypothesis that *avei* 'too' conveys that another contextually salient entity has the property denoted by the predicate of the utterance in which *avei* 'too' occurs (see also Heim 1992; Geurts and van der Sandt 2001; Kripke 2009 for English *too*). Thus, in (17a), *avei* 'too' is hypothesized to convey the implication *m* that Guaraní is spoken in another contextually salient country. The context of (17a) is *m*-neutral since German school children that have not yet heard about Paraguay don't know of a contextually salient country besides Argentina in which Guaraní is spoken. As indicated by the hash mark (#), the consultant judged this utterance to be unacceptable in this context.

(17) a. Context: The children in a geography class in Germany have to give presentations about different countries in the world. Malena is the first to go; the country she has to talk about is Argentina. She starts as follows:

#Argentína-pe **avei** o-ñe-ñe'ẽ guaraní-me.
Argentina-in too A3-JE-speak Guaraní-at

#'In Argentina, too, Guaraní is spoken.'

To conclusively show that the unacceptability of (17a) is due to *avei* 'too' introducing a Contextual Felicity constraint with respect to *m*, the consultant was asked to judge the acceptability of the same utterance in the contexts in (17b) and (17c), both of which are *m*-positive: the context in (17b) is *m*-positive since there being another country besides Argentina in which Guaraní is spoken is highly salient for Paraguayan school children; the (linguistic) context in (17c) is *m*-positive since it explicitly provides the information that Guaraní is spoken in Paraguay. The target utterance in (17a) was judged acceptable by the consultant in these contexts. Since they form minimal pairs with (17a), we conclude that *avei* 'too' in (17a) is associated with a Contextual Felicity constraint with respect to *m*.

(17) b. Context: same as in (17a), except that the class is in Paraguay.

c. Context: same as in (17a)

Paraguáy-pe o-ñe-ñe'ẽ guaraní-me. Argentína-pe **avei** o-ñe-ñe'ẽ guaraní-me.
Paraguay-in A3-JE-speak Guaraní-at Argentina-in too A3-JE-speak Guaraní-at

'In Paraguay, Guaraní is spoken. In Argentina, Guaraní is spoken, too.'

The example in (18) features the demonstrative noun phrase *pe mitã'i* 'that little boy'; we explore the implication *m* triggered by this noun phrase that the respective demonstratum can be identified. As indicated, the utterance was judged unacceptable in the *m*-neutral context in (18a). The context in (18b) is *m*-positive context: here, the information that introduces *m* to the common ground is presented in the form of a picture. Since the target utterance in (18a) is acceptable in the context in (18b), we conclude that demonstrative noun phrases in Guaraní (and English) introduce a Contextual Felicity constraint with respect to the implication that the demonstratum can be identified.

(18) a. Context: The children in a sociology class have to give presentations about their families. Marko is up first and he starts with:

#**Pe mitã-'i** che-ryvy.
that child-DIM B1sg-younger.brother

#'That little boy is my younger brother.'

b. Context: As in (18a), but now Marko also brings to the presentation a picture of a person that he shows to the class.

The last example of this set is concerned with the third person (animate) pronoun *ha'e* and the implication that the referent of the pronoun is contextually salient. As illustrated in (19), the utterance with *ha'e* in (19a) is unacceptable: the context is *m*-neutral since neither the context of utterance nor Marko's utterance makes salient a unique third person. In contrast, Marko's first utterance in (19b) introduces such a salient third person, thus resulting in the second utterance being interpreted in an *m*-positive context. We conclude that *ha'e* is associated with a Contextual Felicity constraint with respect to the implication that there is a contextually salient entity.

(19) Context: The children in a sociology class have to give presentations about their families. Marko is up first and he starts with:

a. #**Ha'e** chokokue.
pron.S.3 farmer
(S/he is a farmer.)

b. Che-ru réra Juan. **Ha'e** chokokue.
B1sg-father name Juan pron.S.3 farmer
'My father's name is Juan. He is a farmer.'

We turn finally to some results which might seem surprising in light of standard assumptions: the behavior of Guaraní possessive noun phrases and change of state constructions with respect to the Contextual Felicity diagnostic. As illustrated for these two construction types in (20a) and (20b), respectively, the Guaraní consultant judged these examples (and others like them) acceptable in contexts that are neutral with respect to the (projective) implications. In (20a), the context is neutral with respect to the implication that the woman has a dog and the context in (20b) is neutral with respect to the implication that Laura used to do drugs.

(20) a. Context: A woman who is being interviewed by a school director for a job as a teacher says:
A-ha-va'erã a-me'ẽ-ha-guã **che-rymba** **jaguá-pe** hembi'u-rã.
A1sg-go-MUST A1sg-give-NOM-PURP B1sg-domesticated.animal dog-at B3.food-NOM.PROSP
'I have to go now to feed my dog.'

b. Context: Laura asks her parents to sit down with her because she has to tell them something:
Nd-a-je-droga-vé-i-ma.
NEG-A1sg-JE-drug-more-NEG-already
'I've stopped doing drugs.'

Thus, according to the diagnostic in (12), possessive noun phrases are not associated with a Contextual Felicity constraint with respect to the implication that the possessor has the possessum (the possession implication), and the change of state construction is not associated with a Contextual Felicity constraint with respect to the implication that the pre-state once held.

As noted at the beginning of this section, there is a widespread view that (the English translations of) these expressions *do* impose constraints on contexts in which they are used. This view could be rendered consistent with the judgments reported here by assuming the availability of a process of *accommodation* (Lewis 1979, building on Stalnaker 1974), a process whereby the interpreter "updates" her view of the context to render it suitable for the utterance of the relevant trigger. From this theoretical perspective, those triggers which test positive on the diagnostic for the Contextual Felicity constraint are subject to a particularly strong version of the constraint which cannot be satisfied by accommodation. Those which test negative on the diagnostic might either be subject to a weak version of the constraint, allowing for satisfaction via accommodation; or might not be subject to the constraint at all. Simons et al. (2010) present arguments against the accommodation view, and we will interpret the results presented here as distinguishing between triggers which impose a Contextual Felicity constraint, and those which don't. However, it would not significantly affect the overall conclusions of this paper if instead the diagnostic was taken to distinguish between triggers which have a strong Contextual Felicity constraint, and those which have a weak such constraint, if any.[13]

In sum, triggers of (projective) contents in both Guaraní and English fall into two groups with respect to the Contextual Felicity constraint: expressives, appositives and the adverb *aimete* 'almost' are not associated with a Contextual Felicity constraint, while certain implications of triggers like *avei* 'too', demonstrative noun phrases and pronouns are. The full set of results are summarized in Table 2 in section 6. These results replicate previous findings for English (see e.g. Chierchia and McConnell-Ginet 1990; Beaver 2001; Potts 2005); that comparable Guaraní expressions impose similar constraints contributes to our understanding of cross-linguistic semantic/pragmatic variation.

4 Projection

This section formulates a diagnostic for the Projection property, and discusses its application on the basis of Guaraní data. The relevant property, characterized in (21), refers to the 'Family of Sentence variants' of a sentence S, which is defined as a set of sentences consisting of S, the negative of S, the interrogative of S, a modal variant of S and a conditional with S as its antecedent.

[13]On the accommodation view, it is standard to assume that propositions can be accommodated only if they are relatively uncontroversial and plausible. The Guaraní consultant found acceptable (but chuckled at) utterances with possessive noun phrases in *m*-neutral contexts, even if was highly implausible that the possessor could have the possessum (e.g. if *che-jagua* 'my dog' in (20a) was replaced with *che-jaguarete* 'my tiger'). She only considered unacceptable utterances with the change of state construction that were false in the actual world (if, for instance, the consultant's sister's name was used in (20b) instead of *Laura*).

(21) **Projection**
A content *m* of expression *t* is projective (i.e. has the property of Projection) if and only if *m* is typically implied by utterances of atomic sentences *S* containing *t* and may also be implied by utterances of Family of Sentence variants of *S*.

Given that Projection is the core property we are investigating, it might be expected that we would begin the paper with the diagnostic for this property. The reason we do not is that, in order to test a particular trigger for Projection, one must first determine whether the trigger is subject to a Contextual Felicity constraint (with respect to the target implication) or not. Where there is no such constraint, projection of implication *m* can be diagnosed using implication judgments in an *m*-neutral context. However, where there is such a constraint with respect to *m*, a different strategy must be used. In fact, in the literature, the Family of Sentences diagnostic is often applied to decontextualized examples, as illustrated for utterances containing *the present queen of France* in (1). However, this strategy cannot be used to elicit reliable judgments from consultants. Since decontextualized utterances containing triggers associated with a Contextual Felicity constraint are infelicitous, it is futile to ask a consultant to judge whether e.g. the Guaraní variants of (1a,b) in (22a,b) imply that there is a boss (king) of France.

(22) a. #Ko mburuvicha Fránsia-gua oi-ko Lóndre-pe.
this boss France-from A3-live London-in
'This boss of France lives in London.'

b. #Ko mburuvicha Fránsia-gua nd-oi-ko-i Lóndre-pe.
this boss France-from NEG-A3-live- NEG France-in
'This boss of France does not live in London.'

Matthewson (2004, 2006) does not apply the Family of Sentences diagnostic to explore presuppositions, presumably since the standard application of this diagnostic requires linguistically untrained consultants to make implication judgments, a type of judgment not considered by Matthewson (2004:380) to be among the "legitimate types of semantic judgment". A methodology briefly entertained in Matthewson (2004) (but subsequently dismissed) is to "test the felicity of sentences like [(23a)], [(23b)], and [(23c)] in a range of discourse contexts, including some which do, and some which do not, contain information corresponding to the presupposition" (p.404).

(23) Matthewson (2004:404)
a. It is Mary who wants fish.
b. It isn't Mary who wants fish.
c. Is it Mary who wants fish?

The idea, we assume, is that, if utterances of Family of Sentences variants are acceptable in *m*-positive contexts and not acceptable in in *m*-neutral ones, one can conclude that a presupposition is triggered. While this is suitable for implications whose triggers are associated with a Contextual Felicity constraint with respect to that implication (and in fact adopted below to diagnose projection of such implications), it is not a reasonable diagnostic for projection for implications not associated with a Contextual Felicity constraint since triggers of such implications are acceptable in *m*-neutral contexts (see section 3). With such triggers, we argue, it is necessary to diagnose projection on the basis of implicit implication judgments. Thus, it turns out to be necessary to use distinct diagnostics for Projection depending on whether a Contextual Felicity constraint is present.

The revised Family of Sentences diagnostic for Projection that can be applied with linguistically untrained native speaker consultants is given in (24). The diagnostic explores the implications of utterances

of an atomic sentence *S* that may give rise to the implication *m* to be tested for projection, as well as the implications of utterances of other Family of Sentence variants of *S* (referred to as *FOS(S)* in (24)). Three subdiagnostics are distinguished since consultants react differently to utterances containing triggers associated with a Contextual Felicity constraint than to ones that do not contain such a trigger. Subdiagnostic I., which applies to triggers associated with a Contextual Felicity constraint with respect to the projective content *m*, is the diagnostic entertained in Matthewson (2004) discussed above. Subdiagnostic II. applies to triggers not associated with a Contextual Felicity constraint; like subdiagnostic III., it relies on implicit implication judgments. The distinction between subdiagnostics II. and III. is that the latter is used with triggers associated with a Contextual Felicity constraint not with respect to the implication *m* being tested but with respect to another implication *n*, which necessitates appropriately controlling the context. In both subdiagnostic II. and III. it is vital that the context is *m*-neutral so that a judgment that *m* arises from an utterance can be uncontroversially attributed to the utterance itself.

(24) **Family of Sentences diagnostic for Projection**
Let *S* be an atomic sentence which may give rise to implication *m* and *FOS(S)* be the Family of Sentences variants of *S*.

I. **Trigger *t* imposes a Contextual Felicity constraint with respect to *m*:** If utterances of *FOS(S)* are judged unacceptable in an *m*-neutral context and acceptable in an *m*-positive context, the implication *m* is projective.

II. **Trigger *t* does not impose a Contextual Felicity constraint with respect to *m*:** Test whether *m* is implied by utterances of *FOS(S)* in an *m*-neutral context.

III. **Trigger *t* does not impose a Contextual Felicity constraint with respect to *m*, but with respect to some other implication *n*:** Test whether *m* is implied by utterances of *FOS(S)* in an *m*-neutral and *n*-positive context.

4.1 The Family of Sentences in Guaraní

The Guaraní constructions used in the Family of Sentences diagnostic are illustrated in (25): the simple positive declarative sentence in (25a) is negated in (25b) and realized as a question in (25c). It occurs as a clausal complement of the possibility modal *i-katu* (B3-possible) 'it's possible' in (25d) and constitutes the antecedent of a conditional, marked with *–ramo* 'if', in (25e).[14]

(25) a. Kuehe Cárlos o-jahu.
yesterday Carlos A3-bathe
'Carlos bathed yesterday.'

b. Kuehe Cárlos **nd**-o-jahú-**i**.
yesterday Carlos NEG-A3-bathe-NEG
'Carlos didn't bathe yesterday.'

c. Kuehe-**pa** Cárlos o-jahu?
yesterday-QU Carlos A3-bathe
'Did Carlos bathe yesterday?'

d. **I-katu** Cárlos o-jahu kuehe.
B3-possible Carlos A3-bathe yesterday
'It's possible that Carlos bathed yesterday.'

[14]Propositional attitude constructions with e.g. 'think', 'say' and 'wonder' have also been successfully applied in Guaraní to diagnose Projection, but are but are omitted here for reasons of space. With such constructions, one must control for the possibility of modal subordination (Roberts 1989, 1995; Heim 1992).

e. Kuehe Cárlos o-jahú-**ramo**, heta o-ké-ta ko ára-pe.
yesterday Carlos A3-bathe-if much A3-sleep-PROSP this day-at
'If Carlos bathed yesterday, he is going to sleep a lot today.'

While an utterance of the atomic sentence in (25a) commits a Guaraní speaker to the proposition that Carlos bathed yesterday, none of the utterances in (25b-e) do, which we maintain renders these constructions suitable for the Family of Sentences diagnostic for projection. To motivate that this is the case, consider, for example, utterances of (25a-e) in the context in (26):

(26) Context: Carlos is a baby and his sister Maria needs to tell Carlos' caretaker whether Carlos bathed yesterday. Maria overhears her mother say (25a-e) to her father.

Consultants were asked whether Maria will tell the caretaker that Carlos had a bath yesterday or not: they responded 'yes' with respect to (25a), 'no' with respect to (25b) and 'I don't know' with respect to (25c-e). This suggests that (25b-e) do not imply that Carlos bathed yesterday, i.e. that uttering these constructions does not commit the speaker to the content of atomic sentence embedded in the constructions.

Some additional comments about these constructions are in order. First, sentential negation in Guaraní is realized as a verbal circumfix, as illustrated above, and only expressions inside the circumfix are in the scope of negation (Tonhauser 2009). Since, for instance, adverbs like *avei* 'too' cannot occur inside the negation circumfix, as illustrated in (27), negation is not always a suitable construction for testing projection in Guaraní (as discussed in footnotes 15 and 16 below).

(27) a. Cárlos nd-o-jahú-i **avei**.
Carlos NEG-A3-bathe-NEG too
'Carlos didn't bathe either.'
b. *Carlós nd-o-jahu-**avei**-(r)i.

The question in (25c) is not the only possible way to form a question from (25a). A question can also be formed by realizing (25a) with an utterance-final rising intonation and by the variant in (28), where the question marker *–pa* 'QU' is realized on *Carlos*.

(28) Cárlos-**pa** kuehe o-jahu?
Carlos-QU yesterday A3-bathe
'Did Carlos bathe yesterday?'

Since no meaning differences between these question variants have been identified so far, this paper assumes they all can be analyzed as a question operator applying to the meaning of the atomic sentence. But the possibility of the questions differing e.g. in their information-structural contribution and possible effects of this variability on projection should be kept in mind.

In addition to the modal construction illustrated in (25d), Guaraní also has modal suffixes, including the necessity modal *–va'erã* in (29a) and the possibility modal *–ne* in (29b). Since the syntactic relation between these modal suffixes and triggers of projective content is not necessarily apparent from the surface string, this paper only uses the modal construction with *i-katu* (B3-possible) to diagnose projection: as illustrated in (29c), we assume that the modal embeds a clause (which may contain a trigger).

(29) a. Context: A woman has just heard that a man's daughter has gotten married.
O-vy'a-íterei-**va'erã**.
A3-happy-very-MUST
'He must be very happy.' (theater play, presented in Tonhauser to appear a)

b. Context: A family is discussing who might disrespect them. The father says to the daughter:
Nde rei-kuáa-**ne**, che-memby!
pron.S.2sg A2sg-know-MIGHT B1sg-child
'You might know, my child!' (theater play, presented in Tonhauser to appear a)

c. **I-katu** [Cárlos o-jahu kuehe].
B3-possible Carlos A3-bathe yesterday
'It's possible that Carlos bathed yesterday.'

We now diagnose Projection in Guaraní.

4.2 Diagnosing projection

Subdiagnostic I. of the revised Family of Sentences diagnostic for projection in (24) identifies the content *m* of a trigger *t* as projective if and only if utterances of *FOS(S)*, where *S* contains the trigger *t*, are judged unacceptable in an *m*-neutral context and acceptable in an *m*-positive context. Recall that this subdiagnostic is to be used for triggers which have already been determined to be subject to the Contextual Felicity constraint with respect to *m*. The idea is that Projection, in these cases, is diagnosed by showing that a constraint associated with a given trigger remains in force even when the trigger is embedded.

The application of the diagnostic to *avei* 'too' is illustrated in the next two sets of examples: the utterance of the atomic sentence with *avei* 'too' in (30a) as well as utterances of Family of Sentence variants in of (30a) in (30b-e) are acceptable in the context of (30), but not in the context in (31).[15]

(30) Context: The children in a geography class in Paraguay have to give presentations about different countries. Malena is up first; the country she has to present on is Argentina.

a. Argentína-pe **avei** o-ñe-ñe'ẽ guaraní-me. (= (17b))
Argentina-in too A3-JE-speak Guaraní-at
'In Argentina, too, Guaraní is spoken.'

b. I-katu Argentína-pe **avei** o-ñe-ñe'ẽ guaraní-me.
B3-possible Argentina-in too A3-JE-speak Guaraní-at
'It's possible that in Argentina, too, Guaraní is spoken.'

c. Argentína-pe **avei** o-ñe-ñe'ẽ-rõ guaraní-me, a-há-ta upépe a-mba'apo-ha-guã.
Argentina-in too A3-JE-speak-if Guaraní-at A1sg-go-PROSP there A1sg-work-NOM-PURP
'If Guaraní is spoken in Argentina, too, I am going to go there to work.'

d. The teacher asks the other children, before Malena starts:
O-ñe-ñe'ẽ-pa Argentína-pe **avei** guaraní-me?
A3-JE-speak-QU Argentina-in too Guaraní-at
'Does one speak Guaraní in Argentina, too?'

[15] As discussed in connection with (27) above, *avei* 'too' cannot be realized inside the negation circumfix. The negative variant of (30a) in (i) is not acceptable in the context in (30), which is congruent with the hypothesis that *avei* 'too' here is not in the scope of negation. The variant in (i) is thus not suitable to diagnose whether the implication *m* of (30a) is projective.

(i) Context: as in (30)
#Argentína-pe **avei** n-o-ñe-ñe'ẽ-i guaraní-me.
Argentina-in too NEG-A3-JE-speak-NEG Guaraní-at
#'In Argentina, Guaraní isn't spoken either.'

(31) Context: The children in a geography class in Germany have to give presentations about different countries. Malena is up first; the country she has to present on is Argentina.

Since (30a) and the other Family of Sentence variants of this example are acceptable in an *m*-positive context and not acceptable in an *m*-neutral context, the diagnostic identifies *m* as a projective content.

The examples in (32) establish that the existence implication of the pronoun *ha'e* (that there is a contextually salient referent) is projective. As indicated, (32b-f) are acceptable in the *m*-positive context established by the utterance in (32a). None of (32b-f) are acceptable without (32a), i.e. in an *m*-neutral context.

(32) Context: Paula is watching a soccer match with Maria, who utters (32a), followed by one of (32b-f).

a. E-ma'ẽ-mi. Pe arkéro o-joko-kuaa.
A2sg-look-DIM that goalie A3-grab-know
'Look. That goalie knows how to grab the ball.'

b. **Ha'e** Caaguasú-gua.
pron.S.3 Caaguasu-from
'He's from Caaguasu.'

c. **Ha'e**-pa Caaguasú-gua?
pron.S.3-QU Caaguasu-from
'Is he from Caaguasu?'

d. **Ha'e** nd-oi-kuáa-i chéve.
pron.S.3 NEG-A3-know-NEG pron.O.1sg
'He doesn't know me.'

e. I-katu **ha'e** Caaguasú-gua.
B3-possible pron.S.3 Caaguasu-from
'It's possible that he's from Caaguasu.'

f. **Ha'e** o-porandú-ramo che-número, a-vy'á-ta.
pron.S.3 A3-ask-if B1sg-number A1sg-happy-PROSP
'If he asks for my number, I am going to be happy.'

Subdiagnostic II. of the revised Family of Sentences diagnostic for projection in (24) identifies a content *m* as projective if and only if utterances of *FOS(S)*, where *S* contains the trigger *t*, imply *m*. This subdiagnostic is used for triggers which do *not* impose any Contextual Felicity constraint. The examples in (33) illustrate the application of the diagnostic to a non-restrictive relative clause; in (33a), the relevant relative clause implies that Sabina's grandfather has a white beard. The context in (33) is *m*-neutral since it does not entail either that Sabina's grandfather has a white beard or that he doesn't. To diagnose whether this implication is projective, the native speaker consultant was told that Sabina says one of (33a-e) to Pamela. The consultant was then asked to judge whether Pamela will try to take pictures of Sabina's grandfather, according to Sabina's utterances. A **[yes]** after the example indicates that the consultant thought that Pamela would try to take his picture, a **[no]** means that the consultant did not think that Pamela would try to take his picture.

(33) Context: Pamela is an art student who wants to take black & white portraits of old men with white beards. Her friend Sabina says (33a-e) to her:

a. Che-aguélo, **hendyva morotĩ-va**, oi-ko mombyry. **[yes]**
1sg-grandfather B3.beard white-RC A3-live far
'My grandfather, who has a white beard, lives far away.'

b. Che-aguélo, **hendyva morotĩ-va**, nd-oi-kó-i mombyry. **[yes]**
B1sg-grandfather B3.beard white-RC NEG-A3-live-NEG far
'My grandfather, who has a white beard, doesn't live far away.'

c. Nd-o-mba'apó-i-rõ ko'ẽro che-aguélo, **hendyva morotĩ-va**, ja-visitá-ta
NEG-A3-work-NEG-if tomorrow B1sg-grandfather B3.beard white-RC A1pl.incl-visit-PROSP
chupe. **[yes]**
pron.O.3
'If my grandfather, who has a white beard, doesn't work tomorrow, we'll visit him.'

d. I-katu che-aguélo, **hendyva morotĩ-va**, o-heja re-nohẽ chupe fóto. **[yes]**
B3-possible B1sg-grandfather B3.beard white-RC A3-let A2sg-take pron.O.3 foto
'It's possible that my grandfather, who has a white beard, will let you take his picture.'

e. Pamela's mother comes and asks:
E-porandú-ma-pa nde-aguélo, **hendyva morotĩ-va**-pe? **[yes]**
A2sg-ask-already-QU B2sg-grandfather B3.beard white-RC-to
'Have you already asked your grandfather, who has a white beard?'

As indicated, the consultant judged each of Sabina's utterances to convey information that would lead Pamela to want to take pictures of Sabina's grandfather. Since Pamela is interested in taking pictures of old men with white beards, we hypothesize that the consultant's responses are due to the content of the non-restrictive relative clause being implied by the examples in (33), thus supporting the hypothesis that this content is projective.

The examples in (34) illustrate the application of the diagnostic for Projection to the prejacent and exclusive implications of utterances containing the suffix *–nte* 'only'. In the given context, the prejacent implicaton of (34a) is the implication that Silvia has already paid and the exclusive implication is that she is the only (relevant) member of the club who has paid. The context is neutral with respect to both of these implications. The consultant was asked, given the utterances in (34), whether Maria would think that Silvia has already paid her dues (**S-yes**) or not (**S-no**), and whether other members have paid their dues (**O-yes**) or not (**O-no**), or whether it is not known whether they did (**O-?**).

(34) Context: Maria is the new financial officer of our sports club. She's working with Carlos, the previous financial officer, to get the finances of the club in order and to identify who still needs to pay their dues for last year. Carlos tells her (34a-d):

a. Sílvia-**nte** o-pagá-ma. **[S-yes, O-no]**
Silvia-only A3-pay-already
'Only Silvia has already paid.'

b. I-katu Sílvia-**nte** o-pagá-ma. **[S-yes, O-?]**
B3-possible Silvia-only A3-pay-already
'It's possible that only Silvia has already paid.'

c. Sílvia-**nte** o-pagá-ma-rõ, o-ñei-kotevẽ pirapire. **[S-yes, O-?]**
Silvia-only A3-pay-already-if A3-JE-need money
'If only Silvia has already paid, money is needed.'

d. Another previous financial officer comes by and says:
Sílvia-**nte**-pa o-pagá-ma? **[S-yes, O-?]**
Silvia-only-QU A3-pay-already
'Has only Silvia paid already?'

The consultant judges that the prejacent implication is implied by each of (34a-d) while the exclusive implication is not.[16] We therefore conclude that the prejacent implication, but not the exclusive, is projective.

The examples in (35) below show application of the diagnostic to the implications of change of state predicates. Since the Guaraní change of state construction is realized using the negation circumfix, as illustrated in (35a), only three of the other constructions considered here can be used to diagnose projection with this trigger. The consultant was asked whether Maria would give the medicine to Marko, given Mario's utterances in (35a-d), with **yes** and **no** as possible answers.

(35) Context: Clara is organizing a health program that gives medicine to everybody who has ever smoked or currently smokes. Maria is administering the program in town A; since she doesn't know the people in the town, she is being assisted by Mario, a local townsman. Mario tells her (35a-d) about Marko.

a. Márko **nd-o-pita-vé-i-ma**. **[yes]**
Marko NEG-A3-smoke-more-NEG-PERFECT
'Marko doesn't smoke anymore'

b. I-katu Márko **nd-o-pita-vé-i-ma**. **[yes]**
B3-possible Marko NEG-A3-smoke-more-NEG-PERFECT
'It's possible that Marko doesn't smoke anymore.'

c. Márko **nd-o-pita-vé-i-ma**-rõ, nd-o-guerekó-i pirapire. **[yes]**
Marko NEG-A3-smoke-more-NEG-PERFECT-if NEG-A3-have-NEG money
'If Marko doesn't smoke anymore, he doesn't have money.'

d. Maria hears another person ask Mario:
Márko-pa **nd-o-pita-vé-i-ma**? **[yes]**
Marko-QU NEG-A3-smoke-more-NEG-PERFECT
'Does Marko not smoke anymore?'

As indicated, the consultant thought that Maria would administer the medicine to Marko as a consequence of each one of Mario's utterances in (35a-d). This suggests that each of Mario's utterances implies that Marko used to smoke. We therefore conclude that the implication that the pre-state held is projective.

Subdiagnostic III. applies when diagnosing implications *m* of triggers not associated with a Contextual Felicity constraint with respect to *m* but with respect to another implication *n*. The difference from subdiagnostic II. is that the context constructed for the test utterance must entail the content of the implication *n*, to prevent infelicity due to failure of a Contextual Felicity constraint. The application of the diagnostic is illustrated with the examples in (36) which contain the demonstrative noun phrase *pe óga* 'that house'; as discussed in section 3, such noun phrases are associated with a Contextual Felicity constraint with respect to the implication that the demonstratum can be identified, but not with respect to the property attribution implication. The context of (36) is thus constructed such that the demonstratum can be identified (both Raul and Ricardo see something ahead in the woods) but Raul does not know what property the demonstratum has. To diagnose whether the implication *m* is projective, the native speaker consultant was asked to judge what Raul will think is ahead in the woods, given Ricardo's utterances in (36a-e).

[16] By similar logic to that discussed in footnote 15, the negative variant of (34a) given in (i) is not suitable to diagnose projection:

(i) Sílvia-**nte** nd-o-pagá-i gueteri. **[S-no, O-yes]**
Silvia-only NEG-A3-pay-NEG still
'Only Silvia hasn't paid yet.'

(36) Context: Raul and Ricardo are walking in a dense forest. Raul sees something ahead in the woods, points at it and says *I wonder what that is*. Ricardo says:

a. Che-aguélo oi-ko **pe óga**-pe. **[a house]**
B1sg-grandfather A3-live that house-in
'My grandfather lives in that house.'

b. Mavavéa nd-oi-kó-i **pe óga**-pe. **[a house]**
nobody NEG-A3-live-NEG that house-in
'Nobody lives in that house.'

c. I-katu mavavéa nd-oi-kó-i **pe óga**-pe. **[a house]**
B3-possible nobody NEG-A3-live-NEG that house-in
'It's possible that nobody lives in that house.'

d. Mavavéa n-oi-kó-i-rõ **pe óga**-pe, jai-ké-ta. **[a house]**
nobody NEG-A3-live-NEG-if that house-in A1pl.incl-enter-PROSP
'If nobody lives in that house, we're going to enter.'

e. O-ĩ-ne-pa oi-kó-va **pe óga**-pe? **[a house]**
3-be-MIGHT-QU A3-live-RC that house-in
'Does anybody live in that house?'

The annotation **[a house]** after the examples indicates that the consultant thought that Raul would think that a house was ahead in the woods, given that particular utterance. This is evidence that the implication that the demonstratum has the property denoted by the noun survives when the demonstrative noun phrase *pe óga* 'that house' occurs embedded in Family of Sentences variants, i.e. that the implication is projective.

4.3 Summary and discussion

This section has shown that the contents explored in section 3 are indeed projective contents. Crucially, we presented evidence that Guaraní has expressions that give rise to projective contents, thus providing the first systematic evidence of projection in a non-European language. The set of contents identified as projective are summarized in Table 2 in section 6.

The crucial insight behind the diagnostic for Projection is different subdiagnostics are needed for triggers that are associated with a Contextual Felicity Constraint and those that are not. The diagnostic developed for the former case relies on judgments of felicity; that for the latter case depends on implicit implication judgments. A slightly revised statement of the diagnostic is given in (37), where the subdiagnostics II. and III. of the version in (24) are folded into subdiagnostic II. with the additional requirement that the context be appropriately controlled for, as illustrated above.

(37) **Family of Sentences diagnostic for Projection**
Let S be an atomic sentence which may give rise to implication m. Let *FOS(S)* be a set of sentences consisting of S, the negative of S, the interrogative of S, a modal variant of S and a conditional with S as its antecedent.

I. **Trigger *t* imposes a Contextual Felicity Constraint with respect to *m*:** If utterances of *FOS(S)* are judged unacceptable in an *m*-neutral context and acceptable in an *m*-positive context, the implication *m* is projective.

II. **Trigger *t* does not impose a Contextual Felicity Constraint with respect to *m*:** Test whether *m* is implied by utterances of *FOS(S)* in a context that is *m*-neutral and appropriately controls for contextual constraints introduced by the trigger.

It is our hope that this diagnostic can contribute to filling the gap in the literature on projection and projective contents, which has mostly relied on data from languages with native speaker semanticists.

An important difference between the present study and previous studies of projective content in many languages (including English) concerns the evidence provided for projection. Levinson and Annamalai (1992), for example, only list Tamil sentences alongside their claimed presuppositions (see also von Fintel and Matthewson 2008:182 for this point) and Matthewson (2006) argues that the St'át'imcets expressions *hu7* 'more', *múta7* 'again/more', *tsukw* 'stop' and *t'it* 'also' are presupposition triggers, but also does not provide evidence for projection. In contrast, the previous section has provided detailed empirical evidence for the relevant contents being projective. This evidence consists of i) the relevant contextualized utterances that form part of the diagnostic, ii) the questions posed to the consultant as well as iii) the consultant's responses that were taken to support the hypothesis that the relevant contents are projective.

Another result of the data presented so far is that Guaraní has different kinds of projective contents: ones associated with a Contextual Felicity constraint and ones that are not. Matthewson (2006) finds that St'át'imcets utterances with the expressions mentioned above are acceptable to St'át'imcets speakers in (what we call) *m*-neutral contexts, which suggests that they are not associated with a Contextual Felicity constraint. This means that Guaraní may differ from St'át'imcets, at least with respect to the triggers *avei* 'too' (Guaraní) and *t'it* 'also' (St'át'imcets).

The finding that Guaraní translations of English triggers of projective content are also triggers of projective content is new. Whether the finding is also surprising depends on one's assumptions about the way in which projective content arises. One position is that natural language expressions conventionally encode their ordinary and their projective content (e.g. Karttunen and Peters 1979). On this view, we might expect to find cross-linguistic differences in whether e.g. the polar implication of an expression like *almost* and its translation in other languages is projective or not; the finding that comparable Guaraní and English expressions so consistently convey the same projective contents is perhaps surprising on this view. Another position is that projective contents are associated with particular expressions by some universal mechanism (e.g. Levinson and Annamalai 1992; Levinson 2011) or that such contents are non-detachable and conversationally derived, so that two expressions (from the same language or from different languages) with the same truth-conditional meaning would have the same projective content (e.g. Levinson 1983,Simons 2001). On this view, one might not expect to find cross-linguistic differences in the projective contents conveyed by comparable expressions. The finding from English and Guaraní then presents support of this view.

5 Local effects associated with projective content

The properties of Projection and Contextual Felicity distinguish two classes of projective contents in English and Guaraní. In this section, we explore another property of projective contents: the property 'Local Effect', defined in (38), distinguishes projective contents that are necessarily contributed to the local context of an operator from those that are not (i.e. can be merely globally contributed); see also e.g. Gazdar (1979), Zeevat (2000) and Potts (2005) for discussions of the variability of projective contents with respect to this property.

(38) **Local Effect**
A trigger *t* of projective content *m* has its effect locally (i.e. has Local Effect) if and only if, when *t* is embedded under operator *O*, *t* contributes the content *m* to the local context of *O*.

Because the property being investigated is perhaps not very familiar, we begin by illustrating it with some cases from English. The embedding operators considered here for the Local Effect diagnostic are contributed by propositional attitude verbs such as *believe* and *think*. (Other operators that could be used to diagnose Local Effect include modals and conditionals.) The local context created by these verbs is the attitude holder's epistemic state; the clausal complement of the verb is interpreted in this local context, which

is potentially distinct from the global (utterance) context. Some propositions denoted by the complement clause may be true in one of the contexts, false in the other. Consider the examples in (39):

(39) a. Jane believes that Bill has **stopped smoking** (although he's actually never been a smoker).
b. Jane believes that Bill, **who is Sue's cousin**, is Sue's brother.

We are interested here in the interaction between the propositional attitude verb and the projective contents of the embedded clauses: in (39a), the proposition that Bill has been a smoker, and in (39b), the proposition that Bill is Sue's cousin. In (39a), the complement of *believe* attributes to Jane the belief that Bill has stopped smoking, which necessarily also attributes to her the belief that Bill has been a smoker in the past, i.e. belief in the start state of the predicate *stop smoking*. This is what we refer to as a Local Effect: the projective content of *stop smoking* contributes to the belief attribution carried out by the embedded clause.

This behavior is in contrast with that of the non-restrictive relative clause (NRRC) in sentence (39b). Although this clause is (at least by appearance) embedded within the complement clause of *believe*, its content does not contribute to the belief attribution: the speaker of (39b) does not attribute to Jane the belief that Bill is Sue's cousin, but only the belief that Bill is Sue's brother. This shows that the projective content contributed by the NRRC does not have a Local Effect.

The example in (40) is a test for Local Effect for the implication of the English pronoun *he* that the referent be salient, which is associated with a Contextual Felicity constraint. In the second sentence of (40), an instance of *he* is embedded in the propositional complement of *thinks*. On the most natural reading of this example, it is clear that Fred does not think that he is contextually salient to the speaker and addressee, since contextual salience is apparently what he is striving to avoid. It therefore follows that the salience implication associated with the English pronoun *he* has no Local Effect (or if we wish to be cautious, that it has no compulsory Local Effect).

(40) Don't look now, but Fred is sneaking around on the other side of the playground in full camouflage. He obviously thinks that **he**'s completely hidden from our sight by all the bushes.

The diagnostic for Local Effect is given in (41). Like the diagnostic for Projection, it has three parts: subdiagnostic I. applies to triggers *t* associated with a Contextual Felicity constraint with respect to *m*; subdiagnostics II. and III. apply to trigger/content pairs where the trigger is not associated with a Contextual Felicity constraint with respect to *m*, though alternatively II. and III. could have been combined, as discussed for Projection above. In the three subdiagnostics, it is assumed that S_1 is an atomic sentence with trigger *t* of meaning *m* and S is a sentence where S_1 is embedded under a propositional attitude verb. If the trigger *t* of content *m* has its effect locally, *m* is part of the belief state of the bearer of the attitude. If, on the other hand, the trigger *t* of content *m* does not have its effect locally, i.e. may have its effect merely globally, *m* need not be part of the belief state of the bearer of the attitude.

Recall that triggers associated with a Contextual Felicity constraint require the content *m* to be part of the relevant context prior to utterance (section 3). With such triggers, Local Effect is diagnosed (per subdiagnostic I.) by setting up a situation in which *m* is part of the global (utterance) context, but in which the bearer of the attitude is explicitly ignorant of *m*, i.e. *m* is not part of the local context, the belief state of the bearer of the attitude. If an utterance of S is unacceptable in this situation, we assume that this is because *m* needs to be part of the local context prior to utterance (which is not the case), i.e. the trigger *t* of content *m* has Local Effect. If, on the other hand, utterance of S is acceptable in this situation, we assume that this is because *m* need not be part of the local context but may be merely part of the global context prior to utterance, i.e. the trigger *t* of content *m* does not have Local Effect.

With triggers not associated with a Contextual Felicity constraint with respect to content *m* (subdiagnostics II. and III.), the diagnostics for Local Effect are based on the general assumption that the belief state of a (rational) bearer of an attitude cannot contain both the content *m* contributed by the trigger *t* as well as

the negation of the content, i.e. $\neg m$. With such triggers, Local Effect is diagnosed by setting up a situation where the belief state of the bearer of the attitude contains $\neg m$. If an utterance of S is unacceptable in this situation, we assume that this is because trigger t contributes the content m to locally, i.e. to the belief state of the bearer of the attitude: utterance of S is unacceptable since the belief state of the bearer of the attitude contains both m and $\neg m$. If, on the other hand, utterance of S is acceptable in this situation, we assume that this is because m is not contributed locally, but may be contributed merely globally, i.e. the trigger t of content m does not have Local Effect. In this case, only $\neg m$ is part of the belief state of the bearer of the attitude.[17]

(41) **Diagnostic for Local Effect:**
Let S_1 be an atomic sentence with trigger t of meaning m.

I. **Trigger t imposes a Contextual Felicity constraint with respect to m:** Let S be a sentence where S_1 is embedded under a propositional attitude predicate. If utterance of S is unacceptable when the common ground entails m but the bearer of the attitude is explicitly ignorant of m, then the meaning m with trigger t has its effect locally.

II. **Trigger t doesn't impose a Contextual Felicity constraint:** Three possible implementations:
   1. Let S_2 be an atomic sentence that implies $\neg m$, and S a sentence where both S_1 and S_2 are conjoined under the same propositional attitude predicate. If utterance of S is unacceptable, then the meaning m with trigger t has its effect locally.
   2. This implementation involves conjoining at the attitude level rather than conjoining clauses within the scope of an attitude predicate. Let S_2 be an atomic sentence that implies $\neg m$ and A the operator contributed by an attitude predicate. If utterance of S of the form "$A\ S_1$ and $A\ S_2$" is unacceptable, then the meaning m with trigger t has its effect locally.
   3. This implementation involves a single sentence S_1 that contains both trigger t of meaning m and also implies $\neg m$. Let S be a sentence where S_1 is embedded under a propositional attitude predicate. If utterance of S is unacceptable, then the meaning m with trigger t has its effect locally.

III. **Trigger t doesn't impose a Contextual Felicity constraint with respect to m, but with respect to another implication n:** This subdiangostic has the same three possible implementations as subdiagnostic II., with the addition that the context in which S is uttered entails that the bearer of the attitude knows n.

5.1 Propositional attitude complements in Guaraní

The Guaraní examples used to diagnose Local Effect feature the propositional attitude verb *(oi)mo'ã* 'think', illustrated in (42): the attitude holder is referred to by the pre-verbal proper name *Juan*; the sentential complement of the attitude predicate is *i-sy hasy* 'his mother is sick', which is (obligatorily) marked with the nominalizing suffix *–ha* on the (verbal) predicate of the sentential complement.

(42) Juan oi-mo'ã i-sy hasy-ha.
Juan A3-think B3-mother B3.sick-NOM
'Juan thinks that his mother is sick.'

[17] We note here that our diagnostics for Local Effect use a surface level notion of locality. As a result, interpretation of the diagnostics is potentially complicated by the fact that an absence of Local Effect could result from different sources. For example, in a framework involving a level of Logical Form (LF) distinct from surface form, perhaps mediated by syntactic movement, there would be a non-surface notion of locality (i.e. locality at LF). In that case, it would be important to know where the trigger was interpreted at LF before drawing strong conclusions about the nature of the projective inferences associated with the trigger. Let us note however, that for the majority of triggers considered in this paper, independent facts about the interpretation of the examples we cite allow us to be confident that the triggers in question are not subject to syntactic movement in any relevant way.

Subdiagnostics II. and III. of the diagnostic for Local Effect call for propositional attitude constructions with conjoined clauses complements. In the example in (43), the clausal complements are conjoined with *ha* 'and'. Evidence that both clauses are complements of the propositional attitude verb is that the verbs of both clauses are marked with the nominalizing suffix *–ha* (which does not occur on matrix clause verbs).

(43) Juan oi-mo'ã [[i-sy hasy-ha] ha [i-túva i-kaigue-ha]]
Juan A3-think B3-mother B3.sick-NOM and B3-father B3-sluggish-NOM
'Juan thinks that his mother is sick and that his father is sluggish.'

The consultant did not find some propositional attitude constructions natural unless the propositional attitude verb was repeated, as in the variant of (43) in (44). We remain agnostic here about whether (44) involves conjunction of sentences (with no independent noun phrase realizing the subject of the second conjunct) or conjunction of verb phrases. What is important is that both complements are understood as being interpreted with respect to Juan's epistemic state.

(44) Juan oi-mo'ã i-sy hasy-ha ha oi-mo'ã avei i-túva i-kaigue-ha
Juan A3-think B3-mother B3.sick-NOM and A3-think too B3-father B3-sluggish-NOM
'Juan thinks that his mother is sick and he also thinks that his father is sluggish.'

That the propositional attitude constructions with *(oi)mo'ã* 'think' indeed create a local context distinct from the global utterance context is illustrated with the examples in (45). In (45a), the global context is one in which Juan's mother is not sick, but the local context created by the propositional attitude verb is one according to which Juan's mother is sick in Juan's belief worlds. (45b) is not contradictory since Juan's belief worlds need not be identical to those of the speaker.

(45) Context: The speaker has just visited Juan's mother and knows that she is healthy.
a. Juan oi-mo'ã i-sy hasy-ha há=katu na-añeté-i.
Juan A3-think B3-mother B3.sick-NOM and=CONTRAST NEG-true-NEG
'Juan thinks that his mother is sick but that's not true.'
b. Juan oi-mo'ã i-sy hasy-ha há=katu n-ai-mo'ã-i (hasy-ha).
Juan A3-think B3-mother B3.sick-NOM and=CONTRAST NEG-A1sg-think-NEG B3.sick
'Juan thinks that his mother is sick but I don't think so (that she is sick).'

We now diagnose Local Effect in Guaraní.

5.2 Diagnosing local effect

Subdiagnostic I. of the Local Effect diagnostic in (41) is used for triggers *t* of contents *m* associated with a Contextual Felicity constraint. It identifies a content *m* as having its effect locally if uttering a sentence *S* (that embeds the sentence that contains the trigger *t* of *m* under a propositional attitude verb) is unacceptable when the global context entails *m* and the bearer of the attitude is explicitly ignorant of *m* (i.e. the local context is *m*-neutral). In (46), we apply this diagnostic to the triggers *avei* 'too' and the pronoun *ha'e* with respect to the existence implication.

(46) a. #Raul o-va Buénos Áires-pe, há=katu Juan nd-oi-kuáa-i. Ha'e oi-mo'ã
Raul A3-move Buenos Aires-to and=CONTRAST Juan NEG-A3-know-NEG pron.S.3 A3-think
Maléna **avei** o-va-ha Buénos Áires-pe.
Malena too A3-move-NOM Buenos Aires-to
#'Raul moved to Buenos Aires, but Juan doesn't know that. He thinks that Malena, too, moved to Buenos Aires.'

b. Context: The speaker, Ricardo and Malena are lost in a city they've never visited before. The speaker, who, together with Ricardo, is a bit ahead of Malena, says:

#E-ma'ẽ-mi! Upépe o-ĩ peteĩ kuimba'e. Maléna nd-o-hechá-i. Ha'e oi-mo'ã
A2sg-look-DIM there A3-be one man Malena NEG-A3-see-NEG pron.S.3 A3-think
ha'e hasy.
pron.S.3 B3.sick

#'Look! There's a man. Malena doesn't see him. She thinks he is sick.'

The global context of (46a) is *m*-positive since Raul is known to have moved to Buenos Aires; the relevant local context is *m*-neutral since the attitude holder Juan is not aware that Raul moved to Buenos Aires. The respective global and local contexts in (46b) are *m*-positive and *m*-neutral, too: while the existence of the man is given in the global context, Malena is explicitly ignorant it. We conclude from the unacceptability of the utterances in (46) that these triggers require their respective implications *m* to have their effect locally, i.e. with respect to the epistemic state of the attitude holder.

Subdiagnostic II. is used to diagnose triggers *t* of content *m* not associated with a Contextual Felicity constraint. In the examples in (47), the second implementation of the subdiagnostic is used to explore the polar implication of *aimete* 'almost' and the prejacent of *–nte* 'only'. In (47a), for example, the clause embedded under the propositional attitude verb *(oi)mo'ã* 'think' in the first conjunct contains the trigger *aimete* 'almost', which implies (here) that Malena did not break her leg (*m*). The clause embedded under the second conjunct implies that Malena broke her leg (¬*m*). Since the examples are unacceptable, we conclude that these contents both have Local Effect.

(47) Context: Juan is a doctor at the scene of an accident. His friend says:

a. #Juan oi-mo'ã Maléna **aimete** o-pe-ha hetyma ha oi-mo'ã avei Maléna o-pe-ha
Juan A3-think Malena almost A3-break-NOM B3.leg and B3-think also Malena A3-break-NOM
hetyma.
B3.leg

#'Juan thinks that Malena almost broke her leg and that Malena broke her leg.'

b. #Juan oi-mo'ã Maléna-**nte** o-pe-ha hetyma ha oi-mo'ã avei Maléna
Juan A3-think Malena-only A3-break-NOM B3.leg and A3-think too Malena
nd-o-pe-i-ha hetyma.
NEG-A3-break-NEG-NOM B3.leg

#'Juan thinks that only Malena broke her leg and that Malena didn't break her leg.'

In (48), Local Effect is diagnosed for the appositive using the third implementation: the appositive implies *m* (that Angela Merkel is Germany's president), while the remainder of the clause implies its negation (that Angela Merkel is the president of Argentina).

(48) Context: Sabine is from Germany and knows the politicians there very well. Angela Merkel, the chancellor of Germany, is currently visiting farmers in Paraguay, among them Juan. Sabine says:[18]

Juan oi-mo'ã Angéla Mérkel, **Alemánia mburuvicha**, ha'e-ha Argentína mburuvicha.
Juan A3-think Angela Merkel Germany boss pron.S.3-NOM Argentina boss

'Juan thinks that Angela Merkel, the German president, is the Argentinian president.'

[18]The context of this example strongly reinforces that Sabine is an expert on German politics while Juan is not. This ensures that the content of the appositive cannot plausibly be part of the epistemic state of the attitude holder. Some utterances where the context was not constrained this way were judged unacceptable by the consultant, suggesting that appositives have Local Effect. Whether there is indeed difference in the extent to which appositives (and non-restrictive relative clauses) have Local Effect in English and Guaraní is a question for future research.

Since the resulting utterance is acceptable in Guaraní (as well as in English), we conclude that appositives do not have Local Effect, i.e. can contribute their content to the global context only. The same is true for Guaraní expressives; see also Potts (2007) and references therein for the observation that expressives do not contribute to the local context.

Subdiagnostic III. of the Local Effect diagnostic in (41) differs from subdiagnostic II. in the way the context is controlled. We illustrate the application of this subdiagnostic with the third person pronoun *ha'e* with respect to the animacy implication in (49a). Since the pronoun is associated with a Contextual Felicity constraint with respect to the existence implication, the global context in which the utterance that contains the (bold-faced) pronoun is interpreted entails the existence of an entity, as does the local context (Malena's epistemic state). Crucially, the local context does not entail that the entity is animate.

(49) a. Context: The speaker, Ricardo and Malena are lost and looking for somebody to ask for directions. The speaker, who is walking ahead with Ricardo, says:

E-ma'ẽ-mi! Upépe o-ĩ peteĩ kuimba'e, há=katu Maléna nd-oi-kuáa-i.
A2sg-look-DIM there A3-be one man and=CONTRAST Malena NEG-A3-know-NEG
Ha'e oi-mo'ã **ha'e**-ha peteĩ ta'anga ita-gui-gua.
pron.S.3 A3-think pron.S.3-NOM one figure stone-of-from

'Look! There's a man over there, but Malena doesn't know that (it's a man). She thinks he is a stone figure.'

The fact that the consultant judges this (and utterances like it) acceptable is evidence that the implication of *ha'e* that its referent is animate does not need to have its effect locally. Additional support for this conclusion is the unacceptability of example (49b), where the complement clause of (49a) is realized as a matrix clause: (49a) would be unacceptable if the animacy implication had to be interpreted locally.[19]

(49) b. Context: The speaker is standing in front of a stone figure.

#**Ha'e** peteĩ ta'anga ita-gui-gua.
pron.S.3 one figure stone-of-from

(Intended: It's a stone figure.)

The example in (50) shows that the implication of demonstrative noun phrases that the demonstratum has the property denoted by the noun does not have the Local Effect property.

(50) Raul mburuvicha há=katu Maléna nd-oi-kuáa-i. Ha'e oi-mo'ã **ko mburuvicha**
Raul boss and=CONTRAST Malena NEG-A3-know-NEG pron.S.3 A3-think this boss
pa'i-ha.
priest-NOM

'Raul is a (company) boss, but Malena doesn't know that (he is a boss). She thinks this boss is a priest.'

[19]The utterance in (i) with the non-attributive demonstrative pronoun *kóva* would be used in this context.

(i) **Kóva** peteĩ ta'anga ita-gui-gua.
this one figure stone-of-from
'This is a stone figure.'

5.3 Summary

In sum, projective contents differ in whether or not they are necessarily contributed locally: the existence implication of the pronoun *ha'e* and the polar implication of *aimete* 'almost', for example, have Local Effect, while the projective content of appositives and the animacy implication of the pronoun *ha'e* do not. The full results of applying the diagnostics for Local Effect are summarized in Table 2 in the next section.

6 Projective content in English and Paraguayan Guaraní

The results of applying the diagnostics for Contextual Felicity, Projection and Local Effect are summarized in Table 2 for pairs of English (E) and Guaraní (G) triggers and contents. The third column identifies the various contents as projective; the fourth and fifth columns identify whether a trigger/content pair has the Contextual Felicity or Local Effect properties (yes) or not (no). The final column identifies the three classes of projective contents that empirically emerge from the application of these diagnostics.

		Property			
Language	**Trigger/Content**	**Projection**	**Contextual Felicity**	**Local Effect**	**Class**
E	Pronoun/existence of referent	yes	yes	yes	**A**
	too/existence of salient alternative	yes	yes	yes	
	Demonstrative NP/ident. of demonstratum	yes	yes	yes	
G	*ha'e* '3rd'/existence of referent	yes	yes	yes	
	avei 'too'/existence of salient alternative	yes	yes	yes	
	Demonstrative NP/ident. of demonstratum	yes	yes	yes	
E	Expressive	yes	no	no	**B**
	Appositive	yes	no	no	
	Non-restrictive relative clause	yes	no	no	
G	Expressive	yes	no	no	
	Appositive	yes	no	no	
	Non-restrictive relative clause	yes	no	no	
	ha'e '3rd'/animacy of referent	yes	no	no	
	Demonstrative NP/property attribution	yes	no	no	
E	*almost*/polar implication	yes	no	yes	**C**
	only/prejacent implication	yes	no	yes	
	stop/pre-state holds	yes	no	yes	
	Possessive NP/possessive relation	yes	no	yes	
G	*aimete* 'almost'/polar implication	yes	no	yes	
	–nte 'only'/prejacent implication	yes	no	yes	
	nda-...-vé-i-ma 'not anymore'/pre-state holds	yes	no	yes	
	Possessive NP/possessive relation	yes	no	yes	

Table 2: Properties of some projective contents in English and Paraguayan Guaraní

We hypothesize that the Projection, Contextual Felicity and Local Effect properties delineate three theoretically cohesive classes A, B and C of projective contents in the two languages. Triggers of projective contents in class A impose a Contextual Felicity constraint with respect to the relevant content, which necessarily has a Local Effect. The contents in class B are not associated with a Contextual Felicity constraint and do not necessarily have a Local Effect. Triggers of projective contents in class C are not associated with a Contextual Felicity constraint and the contents necessarily have a Local Effect.

These three classes of projective content empirically emerge from the application of diagnostics for Contextual Felicity and Local Effect, and align with theoretically identifiable classes of projective contents. The Contextual Felicity constraint can be taken to reflect an anaphoric requirement of a trigger on the context; thus, triggers of projective contents in our class A are expressions typically called anaphoric, including pronouns, demonstrative noun phrases and the adverb *too* (and its Guaraní counterpart). The contents in class B subsume Potts' Conventional Implicatures, but also include projective contents contributed by pronouns and demonstrative noun phrases. Comparing triggers in classes A and B thus suggests that a particular lexical item can give rise to several (projective) implications with distinct status: the third person pronoun *ha'e*, for example, gives rise to both a class A and a class B projective content. With anaphoric triggers, the descriptive content implication thus need not be anaphoric. The set of projective implications in class C are the most heterogeneous of the three classes and we anticipate further subdivisions by considering additional properties of projective contents. Classical presuppositions, such as those triggered by *stop* (and likely also *know* and other factives), are contained in this class, but also possessive noun phrases (with respect to the attribution of the possession relation) and the prejacent of *only* (and Guaraní *–nte*), which is not clearly presuppositional in the classical sense (see e.g. Horn 1996; Roberts 2006; Beaver and Clark 2008 for discussion).

As mentioned above already, we expect this taxonomy to be refined (and even revised) on the basis of consideration of additional properties of (projective) contents. A particularly pertinent question is whether there is a fourth class of projective implications that are associated with a Contextual Felicity constraint but do not have a Local Effect. A possible candidate might be *also*, if it is associated with a Contextual Felicity constraint, like *too*: the example in (51) from Heim (1992) suggests that *also* does not necessarily have its effect locally when realized in a clause subordinate to *think*, since Mary's utterance in (51) does not require Mary's parents to believe that John is in bed.[20] (I_1 indicates that John is the implicit antecent of *also*; I_F identifies the focus associate of *also*.)

(51) Context: Two kids are talking to each other on the phone. (Heim 1992:209)
John: I_1 am already in bed.
Mary: My parents think I_F am **also**$_1$ in bed.

The issue of whether additives like *also* have a Local Effect is vexed. We find Mary's utterances in the following variants of Heim's example odd:

(52) Context: Two kids are talking to each other on the phone.
John: I_1 am already in bed.
Mary: # My parents think I_F am **also**$_1$ in bed but that you aren't.

(53) Context: Two kids are talking to each other on the phone.
John: I_1 am wearing the PJs that you left behind last time we had a sleepover.
Mary: # My parents think I_F am **also**$_1$ wearing those PJs.

Our judgments on (52) and (53) are in agreement with the earlier data in the paper, implying that additives do have a Local Effect. However, in the face of Heim's data, further research is clearly needed. Note that even if, as Heim's data suggested, it were to turn out that additives have no Local Effect, it would still be noteworthy that the potential fourth class of projective contents to which they would belong is, so far as we can tell, suspiciously under-populated. Whether there is a theoretical reason for this is an open question.

Table 2 allows for a comparison between English and Guaraní that reveals many parallels between projective contents in the two languages. All three subclasses of projective contents are populated by expressions from the two languages and, more importantly, there is significant overlap in the properties of the projective

[20] We thank Kai von Fintel (p.c.) for discussion of Heim's example. How to reconcile this example with that in (46a) and whether such data are acceptable in Guaraní is a question for future research.

contents of comparable expressions: for example, the content of expressives is projective in both languages, is not associated with a Contextual Felicity constraint and does not have Local Effect. Likewise, the prejacent implications of Guaraní *–nte* 'only' and English *only* are projective in the two languages, not associated with a Contextual Felicity constraint, but must have their effect locally. The only differences conclusively established so far pertain to variation in the inventory of triggers of projective contents. For example, English, but not Guaraní, has definite noun phrases, which trigger anaphoric projective implications (e.g. Roberts 2003). English third person pronouns like *she* and *he* give rise to gender implications, while the Guaraní third person pronoun *ha'e* only requires its referent(s) to be animate. As discussed in section 3, the question of whether possessive noun phrases and change of state constructions in English and Guaraní differ with respect to a Contextual Felicity constraint is a question for future research.

7 Implications for the taxonomy of meaning and theories of projection

In the introduction to this paper, we observed that projection has largely been treated as a property of presuppositions, and has primarily been explored from this perspective. The evidence we have presented confirms that projection does not, in fact, pick out the traditional class of presuppositions in English or Guaraní. In fact, none of the three classes of projective content identified above encompass the contents traditionally considered presuppositions. The evidence presented above minimally suggests that the classes of projective content A, B and C form a subtaxonomy in a better-developed taxonomy of meaning and are distinct on some dimension from e.g. ordinary entailments. How this subtaxonomy fits into the taxonomy of meaning is a question for future research.[21]

The observation that projective contents are heterogeneous (see also e.g. Chierchia and McConnell-Ginet 1990; Abusch 2002, 2010; Simons 2001; Potts 2005, 2007; Abbott 2006) has important implications for theories of projection. We argue that a principled theory of projection that accounts for all classes of projective content should, if attainable, be preferable to a collection of disparate theories which individually account only for subsets of projection phenomena. Consider, for example, accounts of projection based on the assumption that presuppositions place constraints on the context: on these accounts, presupposition projection occurs when this constraint is required (for one reason or another) to be satisfied outside of the local context in which the trigger occurs (Karttunen 1974; Heim 1983; van der Sandt 1992; Geurts 1999). Since only class A projective implications are associated with a Contextual Felicity constraint, these accounts of projection cannot easily generalize to implications in classes B and C that are not associated with such a constraint (as discussed in detail in The Authors 2010). A similar objection can be raised against even more recent models, like that of Schlenker (2009), where it is assumed that a presupposition is satisfied in its local context if it is entailed by it. Since, in general, the relevant local context is the context set ("which encodes what the speech act participants take for granted", p.2), presuppositions are predicted to project. The heterogeneity of projective contents, in particular the finding that many such contents are not associated with a Contextual Felicity constraint, render empirically implausible an inclusive analysis of projection based on satisfaction.

In theories like that of Karttunen and Peters (1979) and Potts (2005, 2007), projective content is not targeted by entailment-canceling operators since projective content is handled in a separate dimension from ordinary content and is thus not accessible to such operators (see also Jayez 2009 for a related account). As discussed in detail in Amaral et al. (2007), such multi-dimensional theories of meaning are problematic since they cannot account for observed anaphoric interactions between the different kinds of content (see also Lee 2011). A further problem for such analyses is that whether a particular content is projective is context-dependent (Simons et al. 2010), a fact that is not captured by analyses that assume that projective content is conventionally specified as such.

[21] Recent research on evidentials also suggests that evidential utterances may give rise to implications which do not easily fit into the standard taxonomy of meaning (e.g. Faller 2002; Matthewson et al. 2007; Murray 2010).

Schlenker (2007) proposes to capture the projectivity of expressive contents, one of the types of content considered by Potts (2005), by arguing that such contents are 'informative self-fulfilling presuppositions'. Expanding on Stalnaker (2002), the assumption is that since the speaker presents herself as presupposing that *p*, the other speech act participants update their beliefs to take into account the speaker's belief, thus guaranteeing that *p* is common belief and projective. But, as noted in Schlenker (2007:243), this process crucially relies on the relevant content being "indexical and attitudinal, and thus predicat[ing] something of the speaker's mental states". It is unclear, however, whether all projective contents have these properties.

We return, then, to the position proposed in the introduction to this paper: a fully adequate account of projection must be based on a detailed understanding of the empirical behaviors of projective contents. This paper constitutes a contribution to that understanding.

8 Conclusions

This paper has proposed a preliminary taxonomy of projective content on the basis of a detailed exploration of a wide range of projective contents in English and Guaraní. Projection is a property common to all contents considered here, whereas Contextual Felicity and Local Effect point to the heterogeneity of the set of projective contents. The application of the diagnostics for these properties has shown that Guaraní has expressions that give rise to projective contents and that comparable expressions in English and Guaraní exhibit striking parallels with respect to the kind of projective content they convey. The current taxonomy already has strong implications for the taxonomy of meaning and theories of projection, implying classifications which cross-cut the traditional notion of presupposition, which in turn suggests that existing accounts of projection be revised so as to account uniformly for presuppositional and non-presuppositional projective contents. We expect (and hope) that future research on projective contents in other languages on the basis of the diagnostics developed here will lead to further refinements of the taxonomy we have proposed.

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